RAILROAD BONDS AS AN INVESTMENT SECURITY

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Railroad bonds have for many years enjoyed the favor of investors, for reasons which are well established. For over half a century of the greatest period of development which any nation has ever witnessed, the railroads of the United States have proved to be not only the pioneers in the opening and developing of new territory, but also the main arteries for the constantly increasing commerce of the nation. In railroad securities, notably railroad bonds, more than in any other form of corporate security, are to be found the elements which make for stability in value. The railroads have proved themselves necessary to the development of the nation and are directly related to public necessity and convenience. The railroad companies, as the employers of so large a number of the laborers of the nation, are protected in that the prosperity of all is co-related. Further security is found in the fact that so great a proportion of the wealth of the nation is invested in the securities of the railroads. Perhaps the greatest safeguard protecting railroad securities is found in the cost of the railroads themselves and the impossibility of replacing them. It is commonly known that the terminals alone in the large commercial centers of the country are not capable of being duplicated, irrespective of the cost involved. Furthermore it appears highly improbable that any new invention in the aid of transportation will be discovered which will not readily adapt itself to the steam railroad of to-day.

These safeguards, it is believed, will prove themselves an ample protection for investors in railroad securities. Emphasis is given to them at the beginning of this discussion in view of the wide-spread apprehension which has seized upon investors by reason of the agitation in favor of the regulation of railroads by commissions, both state and national, in the interest of the people. Success or failure for the railroads means nothing more or less than prosperity or the reverse for all business enterprises in the United States; oppressive legislation directed against the railroads will certainly affect adversely every business in the country. Under such conditions public opinion will compel fair and equal justice

in the solution of this question of public regulation of railroads. It is proposed herein to outline, in an elementary fashion, some of the considerations which the investor must weigh in determining the value of a railroad bond, and at the same time to point out some of the fallacies of the arguments which commonly influence the rank and file of investors in railroad bonds. Preliminary to the discussion on the desirability of railroad bonds as investments, it must be stated that railroad bonds, like any other form of investment security, are subject to the influence of economic laws. Many rules for investment, which experience has dictated, are often seemingly rendered nugatory owing to a change in monetary and economic conditions.

The four most essential considerations which make a bond attractive in the eyes of an investor are the following:

(1) Security of principal.
(2) Security of income.
(3) Marketability.
(4) Fair rate of interest and reasonable chance of appreciation in value.

By the very nature of the business of railroading, the first three qualities are found to a greater extent in well-selected railroad bonds than in perhaps any other form of corporate obligation; the last-mentioned quality, that of rate of income and chance of appreciation in value, the railroad bond, purchased under favorable conditions, possesses in a marked degree. Thus railroad bonds are by nature a favored investment. National banks are permitted under the laws of the nation to invest funds in railroad securities, a privilege which is expressly denied so far as real estate mortgages are concerned. National banks have repeatedly been allowed to offer railroad bonds as security for public deposits.

During the past decade, it is safe to say, that, all things considered, railroad bonds have been especially sought by investors, as against real estate loans, owing to the generally accepted belief that the interest return in the United States was steadily declining. Until recent years the interest rate on high-class securities fell perceptibly. This tendency to a lower rate was ascribed to various causes, notably to the fact that a vast amount of capital was accumulating year by year in the treasuries of insurance companies, trust companies and banking institutions and in the hands of

custodians of estates, and to the belief that the investment of these funds must create such a demand for first-class bonds as to raise prices materially. Railroad bonds, which for the most part have a long time to run, enjoyed favor because the investor did not care to have his funds returned to him for re-investment at an early date, when in all probability the interest return would be lower. Under the influence of prosperity the investor witnessed the constant increase in value of all property, and naturally favored that form of investment which would appreciate in value, in sympathy with the increase in value of the property on which such investment was based. Real estate mortgages did not hold out such attraction. Owing to their short duration, they did not appreciate, while the appreciation in the price of bonds was very great. Economic conditions have changed during recent years, so that those who to-day hold long-term investment bonds purchased on a low interest basis, find the selling value of their bonds reduced; had they confined their purchases to real estate mortgages, their funds would be returning to them intact for re-investment at the profitable rates which have prevailed since 1905.

Owing to the severe losses during recent years imposed on that class of investors who chose railroad bonds as against real estate mortgages, it is peculiarly fitting at this time, when railroad bonds are selling at much lower prices than have prevailed under like conditions for many years, to point out briefly some of the important qualities which characterize these two forms of investments. It is believed that such comparison will show that well selected railroad bonds, purchased under conditions now existing, will prove decidedly the more profitable investment.

	Railroad Bonds.	Real Estate Mortgages.
As to the security behind the investment.	The security behind well-selected railroad bonds, especially underlying bonds, is fully as great as in the case of real estate mortgages, and in many cases much greater.	The security behind well-selected real estate mortgages is more capable of appraisement, yet proof is not wanting to show that the equity here is not greater than in the case of railroad bonds.
As to the margin of safety in earnings.	A large measure of protection is found. In the case of well-selected underlying bonds the protection is much greater than in real estate mortgages.	A large measure of protection is found generally where the mortgaged property is improved and used for business purposes. Protection is uncertain in the case of dwellings and unimproved property.

	Railroad Bonds.	Real Estate Mortgages.
As to the rate of income.	The interest rate is usually lower on railroad bonds.	The interest rate is usually higher on real estate mortgages by from one-half to one per cent.
As to marketability.	Railroad bonds are readily marketable and at minimum expense. Railroad bonds are for the most part listed and dealt in on prominent stock exchanges.	Real estate mortgages are not readily marketable. Expense attending sale is comparatively heavy. Real estate mortgages are not listed on exchanges.
As to availability for collateral for loans.	Railroad bonds enjoy a high degree of favor among bankers as collateral for loans because of their ready salability. Most bonds pass from hand to hand as readily as bank notes. A banker can easily inform himself as to the probable value of any railroad bond by reference to any one of the numerous railroad and investment manuals.	Real estate mortgages are not promptly accepted by bankers as collateral because they are not readily marketable. The expense to an investor seeking a loan is large, on account of commissions, cost of examination of title, etc.
As to appreciation with advance in value of security.	Railroad bonds, which usually have a long time to run, when purchased at a fair interest return basis, will appreciate in sympathy with the increase in value of the security behind them.	Real estate mortgages, owing to their short maturity, do not rise in market value appreciably, even when the security of the loan is greatly enhanced.
As to depreciation with decline in value of security.	For the very reasons which cause bonds, under normal conditions, to advance when the security behind them increases, railroad bonds usually decline when the security is impaired.	Unless the impairment in the security is great, real estate mortgages do not have a tendency to decline under normal conditions. In this particular real estate mortgages are preferable to bonds.
As to the status in the event of serious impairment of security, and in case of default.	When bondholders find it necessary to take legal steps to protect their investment against threatened default, or in the event of actual default, the expense pro-rated among a large number of bondholders is inconsiderable.	When there develops serious depreciation in the value of the security behind a real estate mortgage, the selling value of the mortgage is greatly lessened, and the lack of ready marketability often entails a severe loss on the investor. In case of default, the holder of the mortgage is often compelled to take over the property at considerable cost and inconvenience.

The advantages in favor of railroad bonds seemingly outweigh those in favor of real estate mortgages. In a time of high interest rates when railroad bonds depreciate and can be purchased on a remunerative income basis, they are much more desirable, yet experience has shown that when railroad bonds sell on a low interest basis, the advantage often lies with real estate mortgages, for, in the case of the latter, the principal sum is not liable to shrinkage under changed monetary conditions except where the value of the security is seriously impaired. Attention has been directed to the marked decline in the prices of bonds during the past few years owing to the changed monetary conditions. Naturally a multitude of investors have, from time to time, been attracted to railroad bonds for the reason alone that they have witnessed a steady increase in price of such bonds, whereas no such appreciation was shown in real estate mortgages. Many investors, who have witnessed the protracted decline in railroad bonds during the past few years, doubtless find themselves ready to accept the satisfactory record of real estate mortgages, during this period, as sufficient proof of the advantages they possess over railroad bonds.

The above comparison of the relative merits of these two classes of investment tends to show that, for the very reason that railroad bonds have declined to a level where they yield a liberal interest return, the investor would do well to study the characteristics of these two classes of investment before passing judgment. Arguments advanced a few years ago, contemporaneous with the conditions prevailing at that time, appeared logically to favor railroad bonds over real estate mortgages as investments; so under present conditions the recent steady decline in the price of railroad bonds argues logically in favor of real estate mortgages. As a matter of fact the conditions recited above indicate that railroad bonds at prevailing prices will prove to be the more profitable investment.

The scope of this article will not allow of a discussion as to the relative merits of railroad bonds and bonds of industrial companies and public utility companies. Such a comparison would favor railroad bonds in respect of many of the considerations which already have been discussed in the comparison of railroad bonds and real estate mortgages. Industrial companies are more exposed to competition than railroad companies, and in many cases their success

is largely dependent upon special benefits which they enjoy, by reason of patent rights, protective tariff, legislation, contracts, etc. So far as public utility companies are concerned, these are franchise corporations pure and simple, and in the majority of instances their capitalization is based largely upon their franchises. Franchises are widely different, and in many cases the benefits conferred by them are circumscribed by so many limitations as to render successful operation under them extremely speculative. The communities granting franchises retain their taxing power. Public utility corporations are always subject to political attacks, and their success is dependent in a great measure upon the state of local public opinion. Railroads own their rights of way and terminals in fee and the many advantages which they enjoy are fundamentally more secure, as already explained.

Instances are not lacking to show that, under certain conditions, inferior grade bonds resist decline where first-class bonds, often the prior obligations of the same company, show decided and continued weakness. Owing to the large increase in the production of gold, the purchasing power of gold has declined, prices generally have risen as a result, stimulus has been given to trade, demands for capital for commercial enterprises have consequently increased very largely and finally interest rates have risen. The investor having $200,000 invested in bonds yielding four per cent per annum enjoys a fixed yearly income of $8,000. With the cost of living increased he becomes impatient to increase his income. Impelled by this motive and by the confidence begotten of general prosperity, he often disposes of his bonds and seeks an investment in some more "attractive" security. Thus the anomalous condition arises where often times "gilt edge" bonds decline more than speculative bonds.

While, therefore, economic and financial conditions have varying influences upon different classes of railroad bonds, yet, for the reasons cited above, it is likely that railroad bonds will continue to be preferred by investors generally over most other forms of corporate security.

The name bond does not carry with it any guarantee of quality. So far as the term is accepted as a synonym of protection or safety, it is, in this day, a misnomer. In recent years so many new kinds of railroad bonds have been introduced into our market, that the investor must use great care lest, in pur-

chasing a bond, he finds himself possessed of a security far inferior in grade to many railroad stocks in which he would not care to invest. There are outstanding to-day various kinds of collateral bonds; bonds the joint obligation of two or more railroads; bonds the joint obligation of railroad and coal companies; participating bonds; convertible bonds; debenture bonds with no security; debenture bonds collaterally secured; debenture bonds to be secured by mortgage in the event of a new mortgage being placed upon the property in the future. The names of bonds vary; as prior lien, general lien, divisional, consolidated, unified, first consolidated, first mortgage, second mortgage, third mortgage, extension mortgage, etc. Needless to say a third mortgage bond may be infinitely more secure than a first mortgage or prior lien mortgage bond.

The value of a bond therefore must rest to-day, more than ever before, upon the earning capacity and the character of the management of the issuing company. The bond may be a first mortgage on property, the value of which is much greater than the face value of the bonds issued against it, yet this bond may suffer considerably in the market, owing to the fact that the issuing company has outstanding other bonds issued against insufficient security, the result being that, if this company's credit becomes impaired, all the bonds of the company, good and bad alike, will suffer depreciation. The value of a bond is based upon the commercial value of the security behind it; the commercial value depends largely upon revenue-producing capacity.

The investor should acquaint himself with the character of the security back of the bond and the legality of the mortgage securing his bond. As a personal examination of the physical property would not be possible or advantageous, the value of the security back of the mortgage must of necessity be judged by its income-producing capacity. The strategic importance of the property securing a bond of course must not be overlooked. So far as the legality of the mortgage is concerned, the average investor must be content to rely upon the judgment of the lawyers who have drawn up the mortgage, being reminded that before such mortgages are recorded they are examined not only by the counsel for the company, but also by the counsel of the trust company in whose favor the mortgage is drawn. An inves-

tor, however, should be careful to read the mortgage, copies of which are usually easily obtained in printed form from the railroad company, for thus he will learn the provisions which may exist for the retirement of the bond earlier than maturity, for participation by the bondholder in profits of the company, for the optional conversion of the bond into stock of the company, for provisional voting power accorded to the bondholders, etc. It is important, also, to know when underlying bonds mature, and whether or not such underlying bonds may be extended at maturity.

It is important to the holder of collateral trust mortgages to ascertain whether or not the capital stock of the companies, whose bonds may be pledged thereunder, is deposited with the trustee. If it is so deposited, the holders of the collateral bonds, in case of foreclosure, come into possession of the immediate control of the physical property. Those collateral trust mortgages which best protect the interests of the bondholder provide, where the parent company has made use of its voting power to effect a lease of the subsidiary company's properties, that, upon default in the payment of interest on the collateral trust bonds, such lease shall immediately terminate. Provisions are frequently found in collateral trust mortgages restricting the powers which would naturally belong to the parent company as owner of the capital stock of a subsidiary company; such provisions relate to the power to consolidate, to sell property, to issue bonds, etc. Some collateral trust mortgages provide for the sale of the collateral without the necessity of foreclosure. In the mortgage securing the Chicago, Rock Island & Pacific Railroad collateral four per cent bonds of 2002, secured by deposit of the capital stock of the Chicago, Rock Island & Pacific Railway, this clause is found, coupled with the provision that, when the stock is sold, bondholders may bid it in, using their bonds at their face value in payment. Thus, although the bonds themselves should sell at fifty cents on the dollar, and other bidders should make a cash offer of seventy-five cents on the dollar for the collateral, the bondholders would have a decided advantage in the bidding, for they could bid par for the collateral and make payment in their bonds at their face value. Sufficient illustrations have been given to show that the casual investor in railroad bonds will find great advantage in reading the mortgages.

Those bonds which are by statute declared a legal investment

for savings bank and trustees, are considered rightly the safest bonds. The laws of New York, Massachusetts and several other states are very strict in limiting such investment. Bonds that are legal in these states are considered "gilt edged." As such bonds bear the stamp of approval of the various states, and as trustees may invest funds in them without liability for loss arising from depreciation, there is a better demand for such bonds, and as a result their market prices are less subject to fluctuation. By reason of the existence of this demand these bonds naturally yield a lower return than other bonds. However, it can safely be stated that there are many bonds which for one reason or another have not become legal, and which may never become legal, which are quite as safe as the so-called savings bank bonds. The investor shows himself astute who studies the laws of the various states, for often he is enabled to secure at an advantageous price, bonds which he foresees will probably soon become legal, owing to compliance with the provisions of the law, as, for example, that provision which provides for the payment by the company in dividends to its stockholders during each of five years an amount equal to four per cent upon all its outstanding capital stock.

The bonds of the larger railroads, especially of important trunk lines, are preferred by many shrewd investors to those of smaller railroads, notwithstanding that the earning power of the one may be relatively less than that of the other. The large railroad derives its traffic from a wide territory, the volume of traffic is not dependent so largely upon local or territorial commercial and agricultural conditions. Local calamities, arising from plague, floods, fire or crop failure, often cause severe inroads to be made in the earnings of small railroads, whereas the influence of these on the earnings of a large system is not threatening. Another reason for the prejudice in favor of the bonds of large railroads is a simple one, namely, that damages arising from accidents, washouts, etc., bear heavily upon small railroads. An accident, such as that which occurred in the tunnel of the New York Central & Hudson River Railroad in New York City in 1902, or a washout, such as that with which the Erie Railroad was visited in 1903, under certain conditions, if visited upon a small railroad, would go far toward impairing its credit.

On the other hand attention should be directed to the fact

that small railroads, if profitable, are often absorbed by large systems, and their bonds become underlying bonds to their great advantage marketwise. The investor, however, who owns bonds of a small issue, is oftentimes at a disadvantage, due to the relatively greater proportion of expense which he must share in the event of the foreclosure of his mortgage.

The bonds of a mortgage which is closed, that is, of a mortgage under the terms of which bonds in addition to those outstanding may not be issued, prove usually more desirable for investment than the bonds of a mortgage which allows of the issuance of additional bonds. The price level of an issue of bonds may range for years between say 95 and 100; the railroad company, finding itself in need of funds at a time when investment or financial conditions are unsatisfactory, may sell additional bonds of this issue at 90. The bankers who purchased are willing to sell at 92, thus establishing a new level for the bonds. Later the company may sell at 85, and the price is accordingly lowered still further. If the bond is indeed desirable its price will eventually rise to its proper level, yet the effect of the issuance of additional bonds, under the circumstances here recited, would be none the less disconcerting to the investor who had purchased his bonds at the higher price.

Underlying bonds can frequently be purchased on as remunerative a basis as the bonds of the refunding or consolidated mortgage of the same company. In such cases the underlying bonds will prove the more desirable investment, from the investor's standpoint, for the reason that they are, so to speak, "more seasoned," that is, are so securely lodged, among a comparatively small number of investors, that they do not come on the market in time of stock panics, etc.

The creation of a refunding or consolidated mortgage and the issuance of bonds thereunder, usually enhance the security of the existing bonds, especially where the proceeds derived from the sale of such bonds are invested in improvements, enlargement of terminal facilities, and the purchase of equipment, for additional expenditures for these purposes tend to fortify the position of the existing bonds. For example, the refunding and extension mortgage created in 1905 by the Colorado & Southern Railway provides for the issuance of many millions par value of bonds for the express purposes of improving, equipping and double tracking of existing

lines. The issuance of these bonds will result in enhancing the value of the security behind the older mortgage issues. The investor should study the financial history of railroad companies, to ascertain how much capital stock may have been sold to stockholders to raise funds for improvements, etc. In recent years railroad companies, whose stock has sold at a sufficiently high premium to allow of an advantageous sale of capital stock to stockholders, have chosen this method for raising funds for the development of their properties. The stock has usually been sold at par or higher. Hundreds of millions of dollars have been secured in this way. The Baltimore & Ohio Railroad has raised over $100,000,000 since 1900 by the sale to stockholders of common stock or of convertible bonds which have since been exchanged for common stock. Among other companies which have secured large sums of money through the sale of capital stock, are to be mentioned the Chicago & Northwestern Railway, the Chicago, Milwaukee & St. Paul Railway, the Great Northern Railway, the Illinois Central Railroad, the New York Central & Hudson River Railroad, the Northern Pacific Railway, the Pennsylvania Railroad, and the Southern Pacific Company. Many railroads, as, for example, the Atchison, Topeka & Santa Fé Railway, the Delaware & Hudson Company, the Erie Railroad, and the Union Pacific Railroad, have raised large sums of money by the sale of bonds or debentures convertible into common stock. There is no need of further comment in emphasis of the importance of this mode of financing to the holders of the underlying bonds of these companies. The bonds of all these companies, and more besides, have been placed in a well-nigh impregnable position so far as their security is concerned.

There are many railroads in the United States to-day whose command of business has been restricted and whose profits greatly reduced, owing to the lack of adequate facilities for handling their traffic. Economical operation, in the present epoch of railroading in the United States, usually results from the expenditure of large sums for improvements, etc. So far from being a cause of anxiety to the investor in the existing bonds of any railroad, as a rule the creation of a new mortgage or the sale of stock by such railroad should bring re-assurance to him. While commenting upon the manner in which the bond issues of certain railroads have been strengthened by the expenditures of large sums derived from

the sale of capital stock, etc., it is proper to add that a tremendous equity has been established for the bond issues of railroads generally, owing to the expenditure for improvements during recent years of large appropriations from surplus earnings. It is safe to say that, notwithstanding the large increase in the amount of dividends paid to stockholders during the last ten years, the aggregate of the dividends paid during this period has not consumed forty per cent of the total surplus earnings available for dividends. The excess of surplus earnings over the dividend payments has, for the most part, been turned back into the property in one way or another.

It is important, from an investor's standpoint, that the railroad company should own in fee the approaches and terminals which it uses in and about large cities. The position of a company which gains access to large commercial centers over tracks owned by other companies is often jeopardized. In such a case it is always prudent to make an investigation as to the terms and limitations of such trackage contracts as may exist.

It has been stated above that the value of a railroad bond rests largely upon the earning capacity of the company, whose obligation it is. So far as the earning capacity is concerned, the investor can readily gain sufficient knowledge for his guidance from a study of the annual reports of the railroads. He must not content himself, however, with the study of the earnings of but a few railroads, for he must remember that value is a relative quality, and that a bond can be said to be cheap or dear only when comparison with other bonds demonstrates its price to be relatively low or relatively high. As a rule comparisons of the earning power of railroads can be made easily and intelligently owing to the fact that all the railroads issue annual reports, which furnish in substantially uniform method the important details of their financial operations.

It is not the purpose here to enter into an exhaustive discussion of the study of railroad reports; there are many manuals and reference books devoted to this subject, which the investor should consult. It will suffice here to dwell upon some of the more important considerations, brought out by the study of railroad reports, which, because least understood, should be of particular interest to the investor.

The income account of a railroad is usually given as follows:

Gross Earnings	$10,000,000
Operating Expenses	6,000,000
Net Earnings	$4,000,000
Miscellaneous income	200,000
Gross Income	$4,200,000
Fixed Charges:	
Interest	$1,500,000
Rentals	100,000
Taxes	375,000
Sinking Fund, Exchange, etc.	25,000
Total Charges	$2,000,000
Surplus	$2,200,000
Dividends	1,000,000
Balance	$1,200,000

It is obvious, as operating expenses absorb so large a proportion of the earnings from all sources, that the investor should inquire into the nature of these expenses. The operating expenditures are classified according to the rules prescribed by the Interstate Commerce Commission. These classifications have for years been embodied under four prominent heads, as follows:

(1) Maintenance of Way and Structures.
(2) Maintenance of Equipment.
(3) Conducting Transportation,
(4) General Expenses.

Beginning July 1, 1907, the railroads of the United States have changed their methods of keeping and rendering accounts, to conform with a new system adopted by the Interstate Commerce Commission. The system of accounts previously in use allowed of the incorporation in maintenance of way and structures and maintenance of equipment, of expenditures of an extraordinary nature for improvements, additions, etc. The new system requires that all these extraordinary expenses, over and above the actual expenses for maintenance, shall be included in a separate item

and deducted from net earnings. Many railroad companies have heretofore been enabled to conceal their true earning capacity by arbitrarily charging to maintenance large sums for improvements; on the other hand, other companies have caused their net earnings to be unduly swollen through inadequate charges to maintenance. While the reports to be issued under the new system of accounting doubtless will show a wide variance in the opinions of different managements, as to what constitutes adequate maintenance, the statements hereafter issued by the railroads will undoubtedly be more intelligible to the average investor. The only way in which the investor may satisfy himself, that a railroad in which he is interested is charging its operating expenses sufficiently for the keeping up of its property is by a comparison of the accounts of that railroad with the accounts of other railroads operating under like conditions in the same territory. The mere fact that companies have adopted a more intelligible method of rendering their accounts does not relieve the investor of the necessity of examining carefully into this question of maintenance.

The new system will not change materially the character of the expenses which heretofore have been included in conducting transportation and general expenses. Conducting transportation expenses will hereafter be divided into two classifications, namely, conducting transportation—traffic, and conducting transportation—operation. To the consideration of the expenses which fall under these headings the investor should give considerable attention, for the significance of their relation to the company's ability to meet its interest payments is not generally understood. These expenses relate and are incident to the immediate conduct of the railroad's business, and, like those commonly called "fixed charges" —interest, taxes and rentals—their payment cannot long be delayed. Maintenance expenses are to a considerable extent capable of curtailment, under necessity or in the discretion of the management, but these other expenses, which include wages, cost of fuel, salaries, legal expenses, etc., must be met if the railroad continues to do business. So the conducting transportation and general expenses are by their character "fixed" charges against earnings. Where the ratio of these expenses to the gross is large and shows no tendency to decrease, the margin of safety for interest becomes less, as is shown in the illustration which follows.

Where, in the comparison of two roads with like character of business, it is found that these expenses of one require a relatively larger percentage of gross than in the case of the other, it means one or both of two things; either that, with relatively like rates for the work performed, the one road is not conducting its business with the same degree of economy as the other, or that, with like relative economy in the conduct of its business, the rates received by it for work performed are relatively smaller. In the use here of the word "economy" it is understood that the measure of economy is net results. To show the significance of this percentage to the investor, take, for example, the Chicago & Great Western Railway and the Chicago, Milwaukee & St. Paul Railway. The character of the tonnage on these two roads is very similar. For the year ending June 30, 1906, conducting transportation and general expenses consumed 48.0 per cent of Great Western's gross earnings against 37.6 per cent for St. Paul. These expenses have required about the same percentage of Great Western's gross earnings each year for the last eight years, and their ratio to gross earnings has shown no tendency to become less. When it is remembered that these expenses partake of the nature of a fixed charge upon gross, the full significance is apparent. Suppose the annual interest, taxes and rentals had required, in 1905-06, 20 per cent of the gross for both Great Western and St. Paul. Of Great Western's gross, then, 68.0 per cent would have been consumed by these "fixed" charges, leaving 32.0 per cent for maintenance and surplus. Of St. Paul's gross, but 57.6 per cent would have been consumed by "fixed" charges and 42.4 per cent would have been left for maintenance and surplus. It is clear that the margin of safety as represented by the surplus would have been far greater for St. Paul than for Great Western. The actual margin of safety for Great Western was less than as given above, because interest, taxes and rentals required 24.0 per cent of the gross for 1905-06 as against 13.7 per cent for St. Paul.

While the larger percentage of gross required for the conducting transportation and general expenses in the case of one road reflects what has been called "relatively less economy" in operation, yet this by no means implies a relative lack of efficiency in the management. A railroad might be operated with the highest degree of efficiency, yet the average rates received, and consequently the

gross earnings, might be so small as to make these expenses bear a very high ratio to the gross.

It will be shown in the discussion of the operating ratio, which follows, that the margin for maintenance and the fixed charges may be greater on the road with large gross earnings per mile, where conducting transportation and general expenses require, say, 42 per cent of the gross, than on the road with small gross earnings per mile, where conducting transportation and general expenses require but 35 per cent of the gross. For the first road 20 per cent of the gross might be ample for maintenance, while 35 per cent of its gross might be an insufficient allowance for the second road. The fact remains after all, that, other things being equal, where these expenses are relatively larger, the margin of safety is relatively less.

It is with great difficulty that many investors are dissuaded from the belief that the operating ratio counts for all. Where a road is reported as operating at fifty per cent it is not uncommon to hear it said that "it cannot be done." Another road reports operating at 75 per cent, and it is said that because of this high operating ratio there is manifestly "abundant opportunity for curtailment in expenses." It may be stated at once that the operating ratio, or the ratio which operating expenses bear to gross earnings, has of itself no significance whatever. A few examples will tend to establish this fact.

The gross earnings and operating expenses of roads "A," "B," "C," "D," and "E" may be taken as given in the table on page 136.

For the sake or argument, it is assumed that it requires for normal maintenance of road and equipment no more "per mile of road" for one of these roads than for another. It is clear that road "A," operating at 55 per cent, makes more liberal outlay for maintenance than roads "B," "C" or "D," which operate at 60 per cent, 65 per cent, and 75 per cent, respectively. Consequently road "A" has greater room for curtailment in its maintenance. Road "A" includes in its operating expenses sums in excess of normal requirements for maintenance, road "B" spends enough for maintenance, while "C" and "D" fall considerably below the average requirements. The $1,500,000, or 15 per cent of its gross, expended by road "D" for maintenance of way on its 5,000-mile road is by far a relatively smaller outlay than that of road "A," where

Average Mileage Owned and Operated	A 1,000		B 1,000		C 2,000		D 5,000		E 1,000	
	Total	Per Mile	Total	Per Mile	Total	Per Mile	Total	Per Mile	Total	Per Mile
Gross Earnings	$10,000,000	$10,000	$10,000,000	$10,000	$10,000,000	$5,000	$10,000,000	$2,000	$30,000,000	$30,000
Maintenance of Way	1,250,000	1,250	750,000	750	1,000,000	500	1,500,000	300	3,000,000	3,000
Maintenance of Equipment	1,250,000	1,250	750,000	750	1,000,000	500	1,500,000	300	3,000,000	3,000
Ratio of "Maintenance" to Gross	25%	.....	15%	.....	20%	.....	30%	.....	20%	.....
Conducting Transportation and General	$3,000,000	$3,000	$4,500,000	4,500	$4,500,000	$2,250	$4,500,000	$900	$9,000,000	$9,000
Ratio of "Cond. Trans. & Gen." to Gross	30%	.....	45%	.....	45%	.....	45%	.....	30%	.....
Total Operating Expenses	$5,500,000	$5,500	$6,000,000	$6,000	$6,500,000	$3,250	$7,500,000	$1,500	$15,000,000	$15,000
Ratio "Operating Expenses" to Gross	55%	.....	60%	.....	65%	.....	75%	.....	50%	.....
NET EARNINGS	$4,500,000	$4,500	$4,000,000	$4,000	$3,500,000	$1,750	$2,5000,000	$500	$15,000,000	$15,000

$1,250,000, or but 12½ per cent of its gross, is so expended on 1,000 miles of road. Now, take road "E." It is seen that while conducting transportation and general expenses require the same percentage or gross earnings, "E," operating at 50 per cent, spends for maintenance 140 per cent more than "A," which is operated at 55 per cent. The table explains itself. It is unnecessary to give more examples (many more might be given) to show that the operating ratio of itself is of no significance. Wherever it may have significance it will be found to be wholly the result of accident.

The statement of the income account given above shows that under fixed charges fall interest on the funded and floating debt, rentals of leased lines, etc., taxes and, in some cases, sinking fund payments. The investor should examine the annual report carefully to ascertain whether or not the full interest on all the bonds outstanding at the close of the fiscal period, has been charged in the income account for the period under review. Another important suggestion which may be made here, is that the investor ascertain what opportunity there may be attaching to this or that road for future saving in interest charges through refunding. The Chicago, Rock Island & Pacific Railway, for example, has little opportunity for future refunding. The Chicago, Burlington & Quincy Railroad, the Chicago & Northwestern Railway, and the Chicago, Milwaukee & St. Paul Railway will each save, through the refunding in the next ten years of high-rate interest-bearing bonds, at least $800,000 per annum, in interest charges.

Very few roads are required to-day to set aside each year from earnings specific amounts for sinking fund purposes. The Chicago, Burlington & Quincy Railroad's annual appropriation for sinking funds is, it is believed, relatively larger than that of any other railroad in this country, excepting where annual payments are made in the retirement of short-time serial bonds, such as the Atchison, Topeka & Santa Fé Railway debentures, Pennsylvania Company 3½ per cent trust certificates, and the Chicago, Rock Island & Pacific Railway collateral trust bonds. In the latter cases the sinking fund charges are not included in fixed charges. For the year ending June 30, 1906, the sinking fund payments of the Chicago, Burlington & Quincy Railway, including interest on bonds held alive in the sinking funds, amounted to $1,500,000. As

such appropriations are in their nature extraordinary, and are used for the retirement of obligations of the company, they must be given due weight in the comparison of the respective earning power of different roads.

As there is of itself no significance in the comparison of the operating ratio of different roads, so, from the investor's standpoint, there is necessarily no significance to be attached to the fact that one road has a bonded debt of $30,000 per mile, while the bonds outstanding on another road amount to but $15,000 per mile. Likewise, the fact alone that the fixed charges of one road amount to $2,000 per mile of road against $1,000 per mile on another shows by no means that the bonds of the latter are more secure. The essential consideration here, as in the case of those quasi-fixed charges, conducting transportation and general expenses, is the ratio which these charges bear to gross earnings and the ability of the road to pay these charges. It stands to reason that the New York Central & Hudson River Railroad with $22,800 per mile gross earnings, could more easily provide for the interest on bonds aggregating $60,000 per mile than could the "Atchison," with $9,200 per mile gross, provide for interest on a bonded debt of $30,000 per mile.

A popular argument advanced in the recommendation of a railroad's bonds is that the railroad is mortgaged for only, say, $15,000 per mile. This may be the case and, under certain conditions, the argument should have considerable weight. Instances will be found where, with a comparatively low debt, the fixed charges are high, due to the large rentals which the railroad is obliged to pay for trackage into cities. The annual interest charges at 4 per cent on the railroad's bonds may be $300,000 and the various rentals for terminals, etc., may be likewise $300,000. The bonds will be recommended on the basis that the entire bonded debt is but $7,500,000, or $15,000 per mile. It is apparent that the combined charges for interest and rentals will equal the interest at 4 per cent on a bonded debt of $15,000,000.

The fact that the railroad costs, in the building, so many dollars, and could not be reproduced except at a cost so much greater than the original cost, has not overmuch significance so far as the value of that railroad's bonds is concerned. It is the earning capacity which counts. An office building erected in

New York City at a cost of $2,000,000 might readily be sold at any time for $2,500,000, whereas such a building, erected in Sitka, Alaska, at a like cost, might not be worth $50,000, for lack of earning capacity.

It demands no proof to show that fixed charges of $600 per mile on one road might be a heavier burden on earnings than fixed charges of $1,000 per mile on another, although in each case the percentage of gross required for these charges is but 20 per cent. Take as gross earnings for the first road $3,000 per mile, and for the second $5,000 per mile. Let conducting transportation and general expenses require 35 per cent of the gross for each road. Here is 55 per cent of gross consumed by "fixed" charges in each case. The one road has 45 per cent of $3,000 per mile, or $1,350 per mile for maintenance and surplus; the other has 45 per cent of $5,000 per mile, or $2,250 per mile remaining for maintenance and surplus.

As a rule, where, on the present basis of earnings, the fixed charges of any given road require less than 20 per cent of gross income, and where the surplus after the payment of all operating expenses (including liberal outlays for maintenance), amounts to about 20 per cent of the gross income, the interest on the road's bonds may be considered quite secure. It should be noted that this is not the same as saying that the interest is secure where the fixed charges require 50 per cent or less of the net income, for the reason that operating expenses (including proper outlay for maintenance) might in one case require 90 per cent of the gross income against 60 per cent in another case. The fixed charges in the first case might require but 50 per cent of the net, or 5 per cent of the gross income; in the second case they might require, likewise, 50 per cent of the net, or 20 per cent of the gross income. Should the gross income show a proportional decrease of, say, 15 per cent for each road, other things being equal, one road would show a deficit after fixed charges, while the other road would show a surplus.

The percentage of fixed charges varies in an inverse ratio with gross earnings. Observe the following tables wherein are given the income accounts of roads "A" and "B," the figures being stated both in full and reduced to a "per mile" basis:

TABLE I.

	A		B	
Miles Operated	1,000		1,000	
Gross Earnings	$10,000,000	$10,000	$10,000,000	$10,000
Operating Expenses	6,000,000	6,000	6,000,000	6,000
Net Earnings	4,000,000	4,000	4,000,000	4,000
Fixed Charges	2,000,000	2,000	3,000,000	3,000
Ratio of Annual Charges to Gross.	20 per cent.		30 per cent.	
Surplus	2,000,000	2,000	1,000,000	1,000
Operating Expenses.				
Maintenance of Way	$1,250,000	$1,250	$1,250,000	$1,250
Maintenance of Equipment	1,250,000	1,250	1,250,000	1,250
Ratio of Maintenance to Gross..	25 per cent.		25 per cent.	
Conducting Transportation	3,000,000	3,000	3,000,000	3,000
General Expenses	500,000	500	500,000	500
Ratio of Conducting Transportation and General Expenses to Gross	35 per cent.		35 per cent.	

In the above comparison of the income accounts of roads "A" and "B," the operating expenses are in every respect similar. The fixed charges of road "A" require 20 per cent of the gross and of road "B" 30 per cent of the gross. The surplus of "A" amounts to $2,000,000 and that of "B" to $1,000,000.

Assume that gross earnings decrease 25 per cent, and that roads "A" and "B" are operated as before at 60 per cent. The income accounts would appear somewhat as follows:

TABLE II.

	A		B	
Miles Operated	1,000		1,000	
Gross Earnings	$7,500,000	$7,500	$7,500,000	$7,500
Operating Expenses	4,500,000	4,500	4,500,000	4,500
Net Earnings	3,000,000	3,000	3,000,000	3,000
Fixed Charges	2,000,000	2,000	3,000,000	3,000
Ratio of Annual Charges to Gross.	26.6 per cent.		40 per cent.	
Surplus	1,000,000	1,000	.....	....
Operating Expenses.				
Maintenance of Way	$950,000	$950	$950,000	$950
Maintenance of Equipment	700,000	700	700,000	700
Ratio of Maintenance to Gross..	22 per cent.		22 per cent.	
Conducting Transportation	2,350,000	2,350	2,350,000	2,350
General Expenses	500,000	500	500,000	500
Ratio of Conducting Transportation and General Expenses to Gross	38 per cent.		38 per cent.	

Here maintenance expenses are curtailed; conducting transportation expenses, while requiring a greater percentage of gross, are smaller, due to less business handled; and general expenses remain the same. The fixed charges remain the same, and they require 26.6 per cent of road "A's" gross and 40 per cent of road "B's" gross. The percentage of gross required for "B's" fixed charges is 10 per cent greater than in the example given first above, while the percentage required for "A's" fixed charges is about 6.6 per cent greater than it was before the earnings decreased. Road "A" shows $1,000,000 surplus, while "B's" surplus is entirely wiped out.

The many consolidations and leases made by railroads in the last few years emphasize yet another consideration, which has an important bearing upon the margin of safety represented by the surplus earnings. The following illustration shows how, solely because of the losses resulting from leases by road "A," the margin over its interest charges was entirely wiped out, notwithstanding the fact that in the year following the taking of these leases, and by reason of them, the margin was increased fifty per cent. On page 142 are given the income accounts of six railroads (Roads "A," "B," "C," "D," "E," "F").

These income accounts are shown for three distinct periods representing three different conditions of affairs which will here be explained. Each of the roads has a capital stock of $200,000, and each earned, as shown in the income account (Schedule I), $20,000, or 10 per cent on its capital. Road "A," being desirous of extending its sphere of influence or of protecting its existing traffic, arranges for the lease of the other five roads, the rental being in each case 9 per cent on the capital stock.

The income accounts (Schedule II) show the result of these leases to the parent road "A" in a prosperous year, when gross earnings were as large as are shown in the income accounts first given (Schedule I). When road "A" was operated alone a surplus of $20,000 was earned. Its equity in the surplus earnings of the leased lines in the year following the making of the leases was such that the actual surplus accruing to road "A" over all its fixed charges and guaranteed dividends was $30,000.

Income accounts (Schedule III) show gross earnings of the roads reduced. The charges against earnings remain the same.

	A	B	C	D	E	F
SCHEDULE I.						
Gross Earnings	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
All Charges	80,000	80,000	80,000	80,000	80,000	80,000
Surplus	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
SCHEDULE II.						
Gross Earnings	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
All Charges	80,000	80,000	80,000	80,000	80,000	80,000
Net	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Gaurantees	00,000	18,000	18,000	18,000	18,000	18,000
Surplus	$20,000	$2,000	$2,000	$2,000	$2,000	$2,000
SCHEDULE III.						
Gross Earnings	$95,000	$95,000	$95,000	$95,000	$95,000	$95,000
All Charges	80,000	80,000	80,000	80,000	80,000	80,000
Net	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Guarantees	00,000	18,000	18,000	18,000	18,000	18,000
Surplus	$15,000	Df. $3,000	Df. $3,000	Df. $3,000	Df. $3,000	Df. $3,000

Road "A" earned, of itself, $15,000, or 7½ per cent on its stock, but owing to the guarantee of dividends on the stocks of the other five roads the deficit of each of these roads amounted to $3,000. Inasmuch as these losses fall upon road "A" and are suffered by that road's capital stock, it appears that as against 15 per cent earned upon road "A's" stock in the previous year nothing is earned in the year of small earnings. Had road "A" not assumed obligations to the stockholders of the other roads its surplus earnings in the prosperous year would have equaled but 10 per cent on its stock against 15 per cent. On the other hand, in the year of small earnings the road would have earned 7½ per cent on its stock instead of earning nothing at all. A study of the reports of the railroads will show, in many cases, that there exist conditions very similar to those described above in the case of road "A."

It has been made clear, from what has been said above, that no absolute rules can be laid down for measuring accurately the value of this, that, or the other railroad bond. The mere statement of any "rules" must of necessity be clothed with so many exceptions and modifications as to make one lose sight of the rules themselves. Each bond must be judged by the particular conditions which surround it. Nevertheless, experience has demonstrated the worth of certain well-defined methods for judging a bond's value, and it has been the purpose of this discussion to set these forth. It is believed that if the investor, in his study of the statements of income accounts of the railroads, is guided by the suggestions given in this paper, he will profit greatly. These suggestions, elementary as they appear to be, are not generally followed, and investors are frequently misled into believing that the margin of safety for a railroad's fixed charges is large, when, as a matter of fact, the reverse is the case.

In conclusion, let it be said that the actual value, as well as the market value, of a bond, often depends upon the character of the management of a railroad and the management's record for conservatism. The market value of excellent bonds has frequently been impaired, despite an increase of the value of the security behind them, owing to a general lack of confidence, on the part of investors, in the ability and integrity of those in the control of the policies of the several railroads.